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ABSTRACT

Many studies in higher education have focused on the development of late adolescent and adult personality change on the assumption that such change was brought about by the college experience. The focus of this study is on the value changes that occur during college years and the changes that endure beyond college. Group and individual values preferences changes are examined with controls for gender, Appalachian status, education beyond the bachelor's level, and involvement in selected alumni activities. The Allport, Vernon, Lindzey Study of Values was administered to the Berea College Class of 1966 as freshmen, seniors, and 21-year alumni. Related literature is discussed, and the Pace alumni survey questionnaire is explained. Change in this class was seen to be the most dynamic during the college period with the greatest change being an increase in aesthetic and a decrease in religious values preferences. The only significant change in the alumni period is an increase in economic values. Males scored higher on theoretical, economic, and political values, and females score higher on aesthetic, social, and religious values. Those educated beyond the bachelor's degree decreased in theoretical and increased in religious values. Participation in alumni activities was quite varied among the respondents. Tables and charts are included. Contains 31 references. (Author/SM)

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A LONGITUDINAL STUDY OF VALUES PREFERENCES CHANGE AS AN INDEX OF ADULT DEVELOPMENT IN BEREA COLLEGE STUDENTS AND ALUMNI

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Paper presented at the

American Educational Research Association

Annual Meeting

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A LONGITUDINAL STUDY OF VALUES PREFERENCES CHANGE AS AN INDEX OF ADULT DEVELOPMENT IN BEREA COLLEGE STUDENTS AND ALUMNI

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Abstract

Many studies in higher education have focused on the development of late adolescent and adult personality change in the assumption that such change was brought about by the college experience. This longitudinal study asks: What value changes occur during the college years and which changes endure beyond college? The Allport, Vernon, Lindzey Study of Values was administered to the Berea College Class of 1966 as freshmen, seniors, and twenty year alumni. The study examines group and individual values preference changes with controls for gender, Appalachian status, education beyond the bachelor's level, and involvement in selected alumni activities. Change is found to be most dynamic during the college years with the greatest change being an increase in aesthetic and a decrease in religious values preferences. The only significant change in the alumni period is an increase in economic values. Males consistently score higher on theoretical, economic, and political values, and females score higher on aesthetic, social, and religious values. Those educated beyond the bachelor's degree decrease in theoretical and increase in religious values as alumni, while participation in alumni activities according to the Pace Alumni Survey Questionnaire was quite varied among the respondents.

A LONGITUDINAL STUDY OF VALUES PREFERENCES CHANGE AS AN INDEX OF ADULT DEVELOPMENT IN BEREA COLLEGE STUDENTS AND ALUMNI

Sherralyn S. Cox

INTRODUCTION

There have been many claims made about the value of a college education with perhaps the most specific assertions having been made about the inherent value of a liberal arts education. These claims about value include the achievement of such diverse college accomplishments as fostering the development of the individual, improving habits of mind, preserving and advancing culture, heightening moral sensitivity, and allowing a holistic understanding to occur (Chickering, 1984; Freedman, 1967; Heath, 1979; Pace, 1974; Perry, 1968; Sanford, 1962). Many studies in higher education have correspondingly focused on the development of late adolescent and adult personality change in the assumption that such change was brought about by the college experience. Change was and continues to be the highlight of research which looks into skills, mental ability, values, and attitudes--all being frequently regarded as indicators of potential change in personality.

An examination of longitudinal research, primarily conducted in the 1950s and 1960s, reveals that the study of student and alumni values, attitudes, and interests was highly regarded as a field of endeavor several decades ago by academicians, especially by those in psychology. In more recent times there have been fewer investigations of student affective change even though more change in affective development than in cognitive learning has been studied. When longitudinal alumni research in the area of values change is considered, there are still fewer available studies. This relative paucity of recent findings is not difficult to understand. Greater freedom for individuals to decline participation in research studies exists today, and among the resources necessary for longitudinal research is the existence of meaningful data compiled because of the foresight of earlier researchers.

There is a need for empirical research which could lead to a better understanding of the outcomes of four years of college. We are unsure about the long-term effects of the college experience. Nor can we adequately delineate the variables associated with such effects. What value changes can occur during the college years and which changes endure beyond the environment of college? With the United States governors being among the latest from the political and public sectors to call for accountability in higher education (Jaschik, 1986) the time seems appropriate to return to investigations of student and alumni change as a means of clarifying some of the outcomes which do occur during and following the experience of college.

Previous research in higher education has examined change as a concept which could be interpreted and labelled in many different ways. One could speak of development, or adaptation, or outcomes, or even of alumni's shifts of opinion and still be speaking, at least potentially, about college-inspired change. Ever since the arrival in 1962 of the seminal work The American College, those in higher education have spoken often about life cycle development as a primary index of individual change with personality frequently being regarded as the main factor in a person's growth and development, or change, as a human being.

The literature of higher education contains indicators of change in student characteristics during their college years. Approaches to the study of such student change and interpretations of the studies' findings have been and continue to be diverse (Chickering, 1984; Feldman and Newcomb, 1969; Freedman, 1967; Jacob, 1957; Lenning, 1974; Sanford, 1962). In his introduction to The Modern American College (1984) Sanford stated that The American College had presented studies that were "...organized around the idea that the development of the student as a person is the central aim of education...", and that, after nearly 20 years of research, this newer work edited by Chickering continued along the same theme. "The overarching purpose of our colleges and universities should be to encourage and enable intentional developmental change throughout the life cycle" (p. xvii). Life cycle development implies development of the adult as well as of the infant, child, and adolescent.

Related Literature

A summary of trends in student and graduate values change was provided by Freedman (1967) who stated that "few students pass through college completely untouched by liberalizing influences" (p. 5). Indeed, the literature abounds with findings indicative of the liberalization of values and attitudes during college with little change being noted following graduation (Arsenian, 1943; Dressel and Lehman, 1965; Elton and Rose, 1969; Heath, 1979; Huntley, 1965; Nelson, 1938; Newcomb, 1943; Perry, 1968; Webster, 1962). Movement on the Study of Values is nearly always evidenced by a decrease during college on the Religious Scale and an increase on the Aesthetic Scale. The other four scales show change of smaller magnitudes and in unpredictable direction (Campbell and Magill, 1968; Dressel and Lehmann, 1965; Huntley, 1965; Stewart, 1964). While typical male/female profiles often exist, where males score highest on Theoretical, Economic, and Political scales and females score highest on Aesthetic, Social, and Religious scales, there is indication that there is a shifting of these more traditional gender associated modes so that the magnitude of the differences in gender scoring are lessened over time (Funk and Willits, 1987; Stewart, 1964).

The primary purposes of this study were to determine (1)which values preferences, when measured at college freshman

and college senior levels, exhibit change; (2)which values preferences of college-educated adults change after the college environment is left; (3)if there are certain variables which can be associated with greater values preference change across time periods; (4)if there are student variables which can be associated with greater change during the college years; and (5)if there are alumni variables which can be associated with greater values preference change during the alumni period.

METHOD

Theoretical Framework

The human personality has been hypothesized as being capable of undergoing perceptible developmental change as people grow older (Allport, 1955, p. 95; Chickering, p. 19; Freedman, p. 22). One of the most frequently cited psychologists and educators who dealt with the phenomenon of personality was Gordon W. Allport. He stated that "...at birth we start with an organism (or individual) which develops unique modes of adjusting to and mastering the environment; these modes constitute personality" (Allport, 1955, p. 61). In addition to the noting of individual adaptation Allport presented another key toward a greater understanding of individuals by using the word unique. Although as a psychologist Allport, as well as others, sought

> to discover general principles of development, organization, and expression of personality...[he continuously emphasized that] the outstanding characteristic of man is his individuality. He is a unique creation of the forces of nature. There was never a person just like him, and there never will be again. (Allport, 1955, p. 4)

More of Allport's own research and writing was devoted to the use of nomothetic factors--to test-scales, ratings, and other more positivistic factors than to idiographic ones such as interviews and biographies. But his use of nomothesis was

> ...for comparative purposes, for approximations to the modes of adjustment that similarly constituted individuals in similarly constituted societies can be expected to acquire, and for the training of the young psychologists in respect to a common language and in the use of analytical procedures. (Allport, 1960, p. 148)

In Pattern and Growth in Personality Allport (1961) emphasized his belief that psychology should develop a mastery of both abstract and concrete phenomena with the individual always being kept within the science (pp. 11-12). His work speaks often of the inner organization of such aspects of a

man's personality as his motives, traits, and personal style with patterned individuality being a necessary "datum for the science of personality" (p. x). How does one accumulate such data indicative of patterned individuality? Allport asked, "What units shall we employ?" He put together a classification of the nomothetic units or the "modes of adjustment" utilized in 1960 in personality assessments. They included: intellectual capacities, syndromes of temperament, unconscious motives, social attitudes, ideational schemata, interests and values, expressive traits, stylistic traits, pathological trends, and factorial clusters (Allport, 1961, pp. 120-123).

> The fact that the units we seek are invisible should not deter us....While we must admit the variabilities of the structures we seek, which are caused by changing situations without and continual growth and change within, we should take this fact into our design and theory, and not surrender our belief that reasonably stable personal and motivational structures exist. (p. 128)

The units chosen for the study described here have been classified above as being of interests and values. These units are "dimensions that deal with structured motives" (Allport, 1961, p. 121). The choice of values as the unit of study relates to "value-orientations as a particularly revealing level of human traits.... A value is a belief upon which a man acts by preference" (p. 454).

Allport was one of the major interpreters of German psychology in the United States (Marx and Hillix, 1973, p. 376), and the German influence had a considerable effect on his approach to values. The work of Edouard Spranger provided a useful typology for Allport's study of personalities both idiographically and nomothetically. Spranger defined six major value-types which he theorized as providing the unifying influences of individual human lives. The typology created does not refer to types of people, even though Spranger's major work is entitled Types of Men. It refers to ideal types understood more fully as "schema of comprehensibility" or gauges for determining "how far a given person has gone in organizing his life" around one of Spranger's six defined types (Allport, 1961, pp. 296-297). The basic schemes or types include the: theoretical, economic, aesthetic, social, political, and religious. The instrument designed to measure the degree to which an individual subscribes to each of these value-directions or types is the Study of Values. It was developed in 1931 and revised in 1951 and 1960. The instrument's authors are Gordon Allport, Philip Vernon, and as of 1951, Gardner Lindzey. The attempt of the Study of Values is to contribute to the study of "value-orientations as an integrating factor in mature personality" (Allport, 1961, p. 300). The instrument's purpose is to relate personality to the

expression of relative value preferences. If traits can be accepted as the fundamental units of personality and values can be seen as being exemplars of personal traits then one can analyze value change as it is indicated by Study of Values measures taken at various points of time during an adult's development.

Sample

The current study involved 93 alumni of the Berea College, Berea, Kentucky, Class of 1966. The data analyzed were collected as a portion of the extensive research actively begun by Berea College and funded by the Lilly Endowment, Inc. for a six year period which began in 1962. The original Berea College study "...sought to identify change in...personal values and attitudes..." (Bobbitt, 1969, p. 10). Efforts were begun in the winter of 1985 to continue the Bobbitt research project after the voluminous files of the 1960s were rediscovered. The project goal was to retest as many of the Berea College Class of 1966 as possible during their twentieth reunion celebration. There were 93 members of the class who in 1986 returned materials relative to the Study of Values analysis.

The student body at Berea College has been since its founding days just prior to the Civil War composed of young people who come from Appalachia. They must exhibit financial need and show academic promise. This homogeneity of students' culture and ability is rare for a college, but it can lend credence to the decision to regard the self-selected group of Berea alumni in 1986 as a representative sample of their class as it existed in 1962. When change is considered, only 53 individuals present a complete series of Study of Values test scores in order to compare freshman, senior, and alumni scoring.

Variables

Several variables were examined during the course of this study including: student ability, student-perceived sources of values choices, college major, current residence, and Holland occupational classification. However, for the purposes of this paper, only the following variables will be discussed: gender, Appalachian status, education beyond the bachelor's level, and involvement in selected alumni activities.

Instrumentation

The current study, based on Allport's work and focusing on changes in the Study of Values, considers values to be central to the development of the personality. The Study of Values purports to relate personality to the expression of relative values preferences. Therefore, examinatin of values preference

scores on the Study of Values can provide an index of individual as well as group status.

Appalachian status was determined from Berea College records indicating the home address of students when they entered college in 1962. If their address was in the region defined as "Appalachia" (Appalachian Center, 1986), they were presumed to be Appalachian natives. The participation in levels of higher education beyond the bachelor's degree was coded according to alumni records made available by the College. Involvement in alumni activities was calculated from their responses to the Pace Alumni Survey Questionnaire. This instrument had its first major use in Carnegie Commission research begun in 1969. The questionnaire itself consists of four sections whose content could be viewed as being "criterion measures, that is, with activities and interests, attitudes and viewpoints, and estimates of progress related to a broad range of intended or relevant outcomes of higher education" (Pace, 1974, p. 20). The topics of the scales are: community affairs, national and state politics, art, music, literature, drama, education, science, religion, intercultural affairs, and international affairs. Individual scales contain from 9 to 14 items.

Research Approach

Because of the small number of subjects presenting complete Study of Values results it was determined that the appropriate statistical procedures would be descriptive. Therefore, summary statistics such as the determination of means and mean change were employed. These analyses were supplemented by techniques of exploratory data analysis such as median polishing, box-and-whisker plots, and stem-and-leaf displays (Tukey, 1977). The observation of group trends is reported. But, in keeping with the idiographic valuing of Allport, personal reports and the notation of individual values preference change are also included in the discussion.

RESULTS

Study of Values Scale Scoring Trends

The focus of this research is on college student and alumni change in values preferences over time. Before the individual scales of the Study of Values are analyzed for change trends, an overview of the Berea College respondents' mean scores will be made. Figure 1 shows the profiles of mean scale scores on the Study of Values for each of the three points of their measurement. Characteristic patterns, or profiles, exist for each year in which the testing was conducted, with greater scoring extremes being evident for the freshman testing in 1962; a general flattening out of the profile for the senior testing in 1966; and a somewhat more

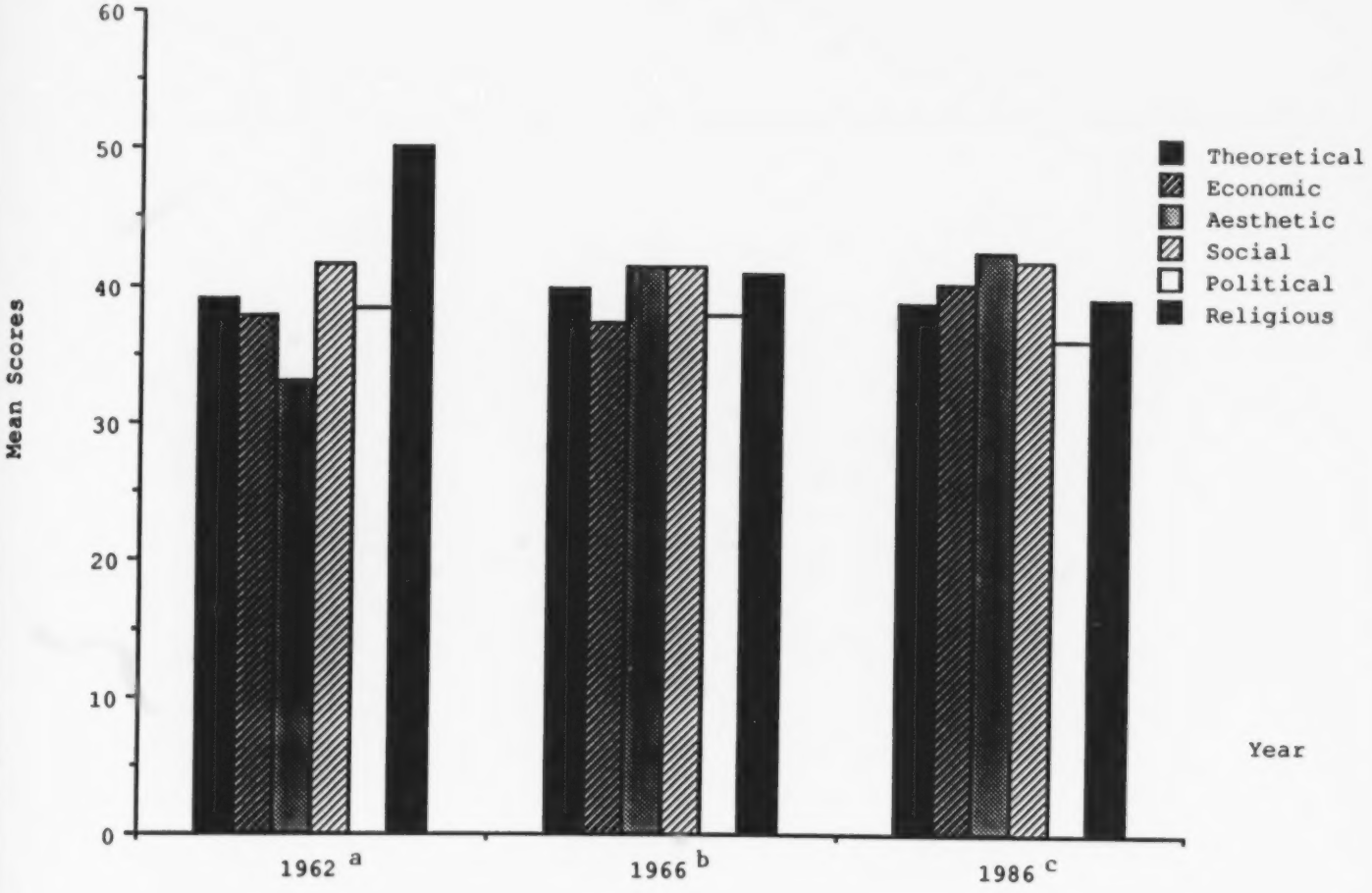

Figure 1. Berea College Study of Values

Mean Scale Profiles by Year

a b c

n=85; n=63; n=89

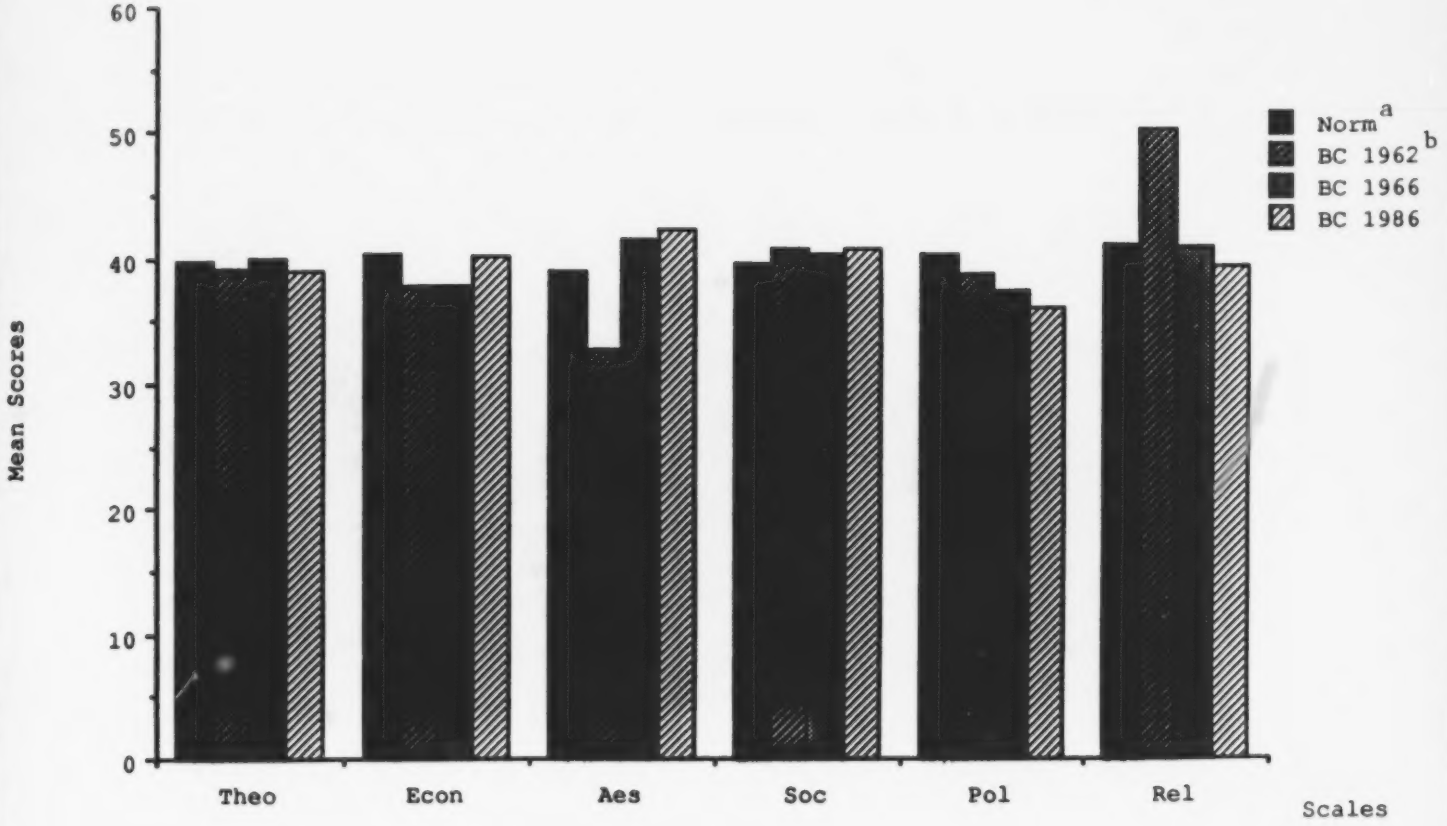

Figure 2. Normative and Berea College Study of Values Mean Scores by Year

[a] N=3778; [b] N=53

differentiated profile returning for the alumni testing in 1986.

The patterns seen in Figure 1 will be further analyzed in successive figures and tables in order to hone in on characteristics and patterns of change which are less obvious or even masked by the use of summary statistics alone. Figure 2 indicates the scale means for the collegiate normative group (Allport, et al., 1970, p. 12) and the Berea College sample having test results for each of the administrations of the Study of Values. The varying number of subjects utilized each year for the charting of Figure 1 is regarded as the expanded sample; it was used as frequently as was possible; and it presents mean scores which are only slightly different from the group of 53 subjects utilized for Figure 2 whose test information is complete for 1962, 1966, and 1986.

Figure 2 shows that Berea freshmen are lower than the normative group on the Theoretical, Economic, Aesthetic, and Political scales; much lower than the norm on the Aesthetic Scale and considerably higher than the norm on the Religious Scale; and quite similar on the Theoretical and Social scales. The Berea College mean scale scores range from a low of 32.7 for 1962 aesthetic values to a high of 50.2 for 1962 religious values. There is a levelling out of scale means following the freshman year--the means become less different from one another. This change in the profile is especially notable for religious values followed closely by aesthetic values. The Theoretical and Social scales reveal the least amount of change for the group across time periods, and they are also most closely associated with the norms.

Another way of looking at the students' or alumni's scoring on each scale for each test administration can be accomplished through the use of selected techniques of exploratory data analysis--box-and-whisker plots and stem-and-leaf displays. Box-and-whisker plots can also be referred to as boxplots when they are produced by the Minitab mainframe computer program. Figure 3 presents boxplots of freshman scoring on each of the Study of Values scales in 1962. The "+" in each box indicates the median score for that scale. The median is more resistant to extreme scores than is the mean. The box encloses fifty percent of the scores in the distribution and demarcates the midspread. The left end of the box is the lower hinge and marks the point of Q1 or the bottom quartile of scores; the right end of the box is the upper hinge and marks the beginning of the top quartile of scores or Q3. Each whisker shows a tail of the distribution. The end point furthest to the left of the left whisker is expressed as an inner fence and, in the case of the Theoretical Scale in Figure 3, reveals the lowest score(s) for Berea College freshmen to be 26. The right whisker's end point to the far right is also called an inner fence, and it reveals that for the Theoretical Scale the highest score is 56. Extreme scores are called outliers, and they are indicated on boxplots with an *. They

can be seen in Figure 3 to be outside the inner fence. The most extreme of the low outliers is for the individual scoring 23 on the Economic Scale; the highest outlier is for the score of 56 on the Aesthetic Scale. The comparison of these two scores alone shows the wide spread of the range of scoring across scales.

When Figure 3 is consulted as a visual display for all the scales for the 1962 administration of the Study of Values, one can see that freshman scoring is highest for religious and social values preferences; scoring is lowest for aesthetic values preferences; and political, theoretical, and economic values preferences are relatively undifferentiated. Since the Study of Values is an ipsative instrument, all scale scores cannot be uniformly high or low, so the Religious and Aesthetic scales' relative extremes in scoring should be considered with this ipsative characteristic in mind.

Figure 4 allows further insight into Berea College performance on the Study of Values by showing senior scoring for each scale. The medians and midspreads can immediately be seen as being more similar than they were in 1962 even though outliers for the Theoretical and Economic scales indicate more extreme scoring for certain of the seniors. The Religious and Aesthetic scales' 1966 scoring encompasses broader ranges than those ranges existing in 1962. This indicates that the respondents become more heterogeneous as seniors.

An additional series of boxplots, Figure 5, pictures the distributions of the 1986 administration of the Study of Values to Berea College alumni. Although the midspreads for all scales fall within the 32 to 46 point range, the tails and outliers of the distributions indicate a group of respondents who continue to be heterogeneous in aesthetic and religious values preferences.

The data analytic technique of median polishing (Professor E. Kifer, course communication, Spring, 1986; Velleman and Hoaglin, 1981, pp. 219-241) was utilized for this study to enable a conceivably more complete interpretation of the research findings by facilitating the determination of trends in the data which might otherwise not be noted. Table 1 provides a median polished version of Study of Values scales' residuals by year of test administration. The Grand Effect (G.E.) is based upon the median rather than the mean. It indicates that in Table 1 the constant common value, or expected value, for scoring is 39.94. This value summarizes the general level of scoring across all six scales of the instrument for all three test administrations. The left-hand column listing the row effects (R. E.) describes differences from scale to scale (or row to row) as they relate to the G. E. The magnitude of each row effect indicates how different each row is from the common value as well as reflecting median differences between scales. The row which lists column effects

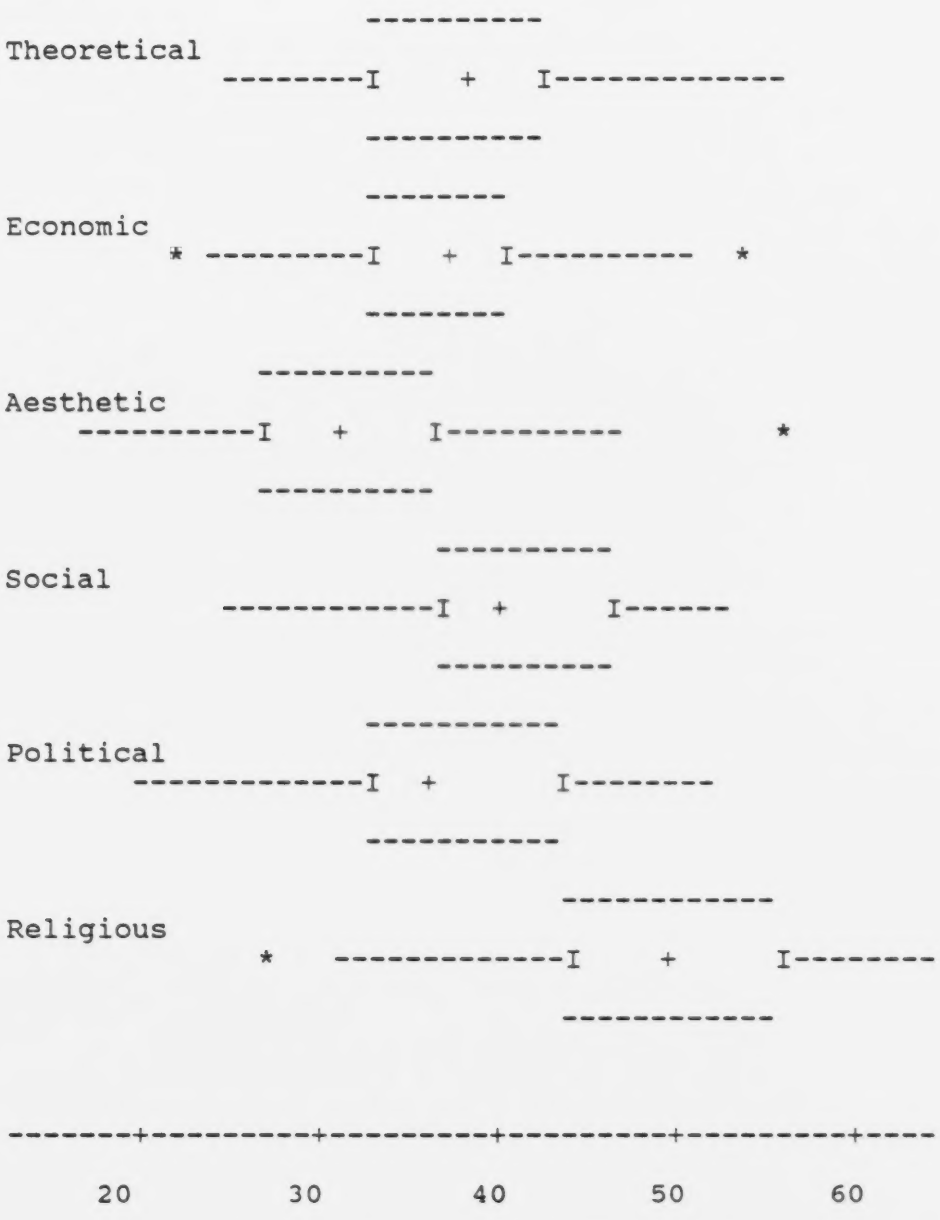

Figure 3. Berea College Freshman Boxplots of Study Values Scale Scores for 1962

n=85

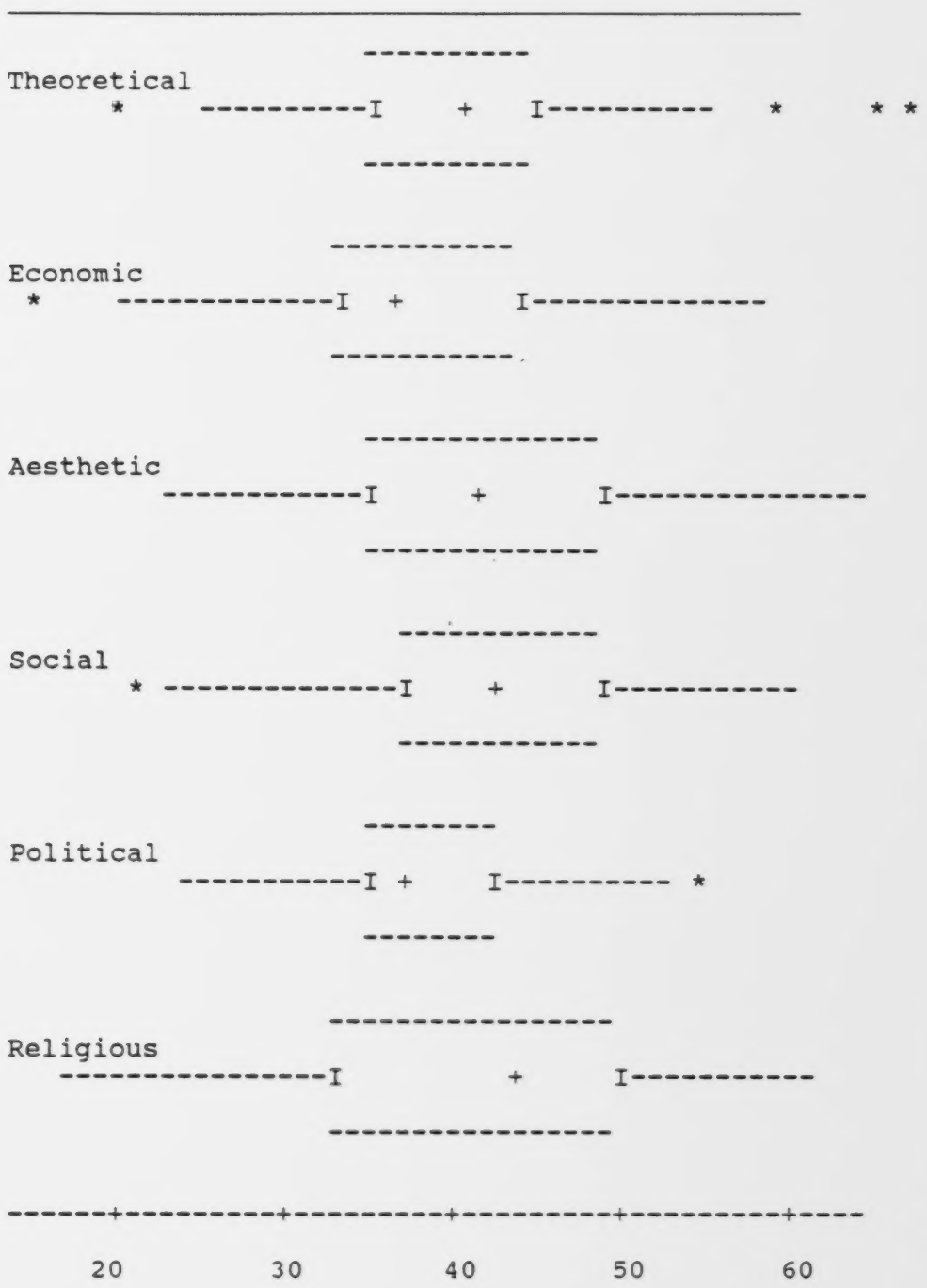

Figure 4. Berea College Senior Boxplots of Study of Values Scale Scores for 1966 n=63

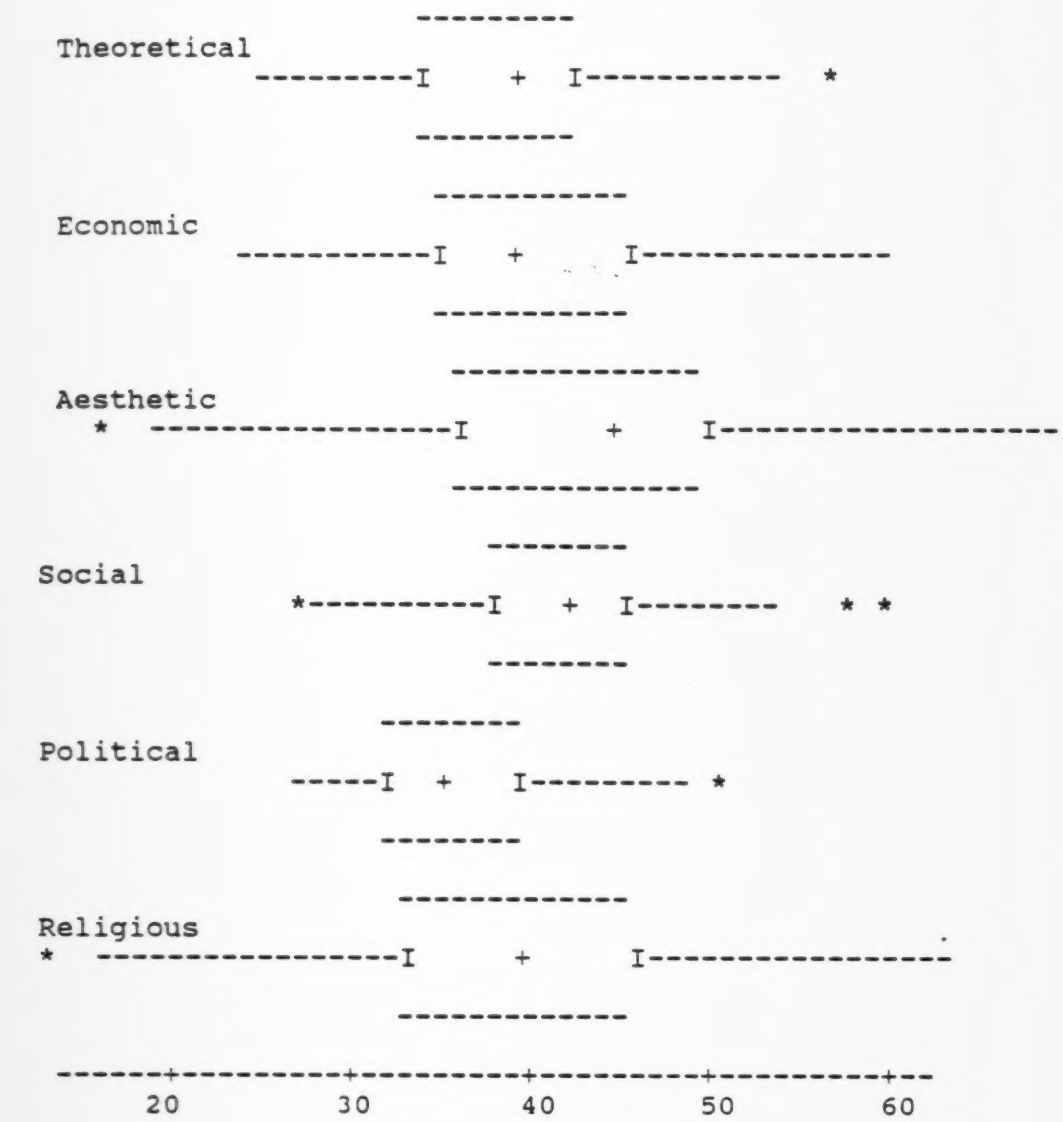

Figure 5. Berea College Alumni Boxplots of Study of Values Scale Scores for 1986

N=89

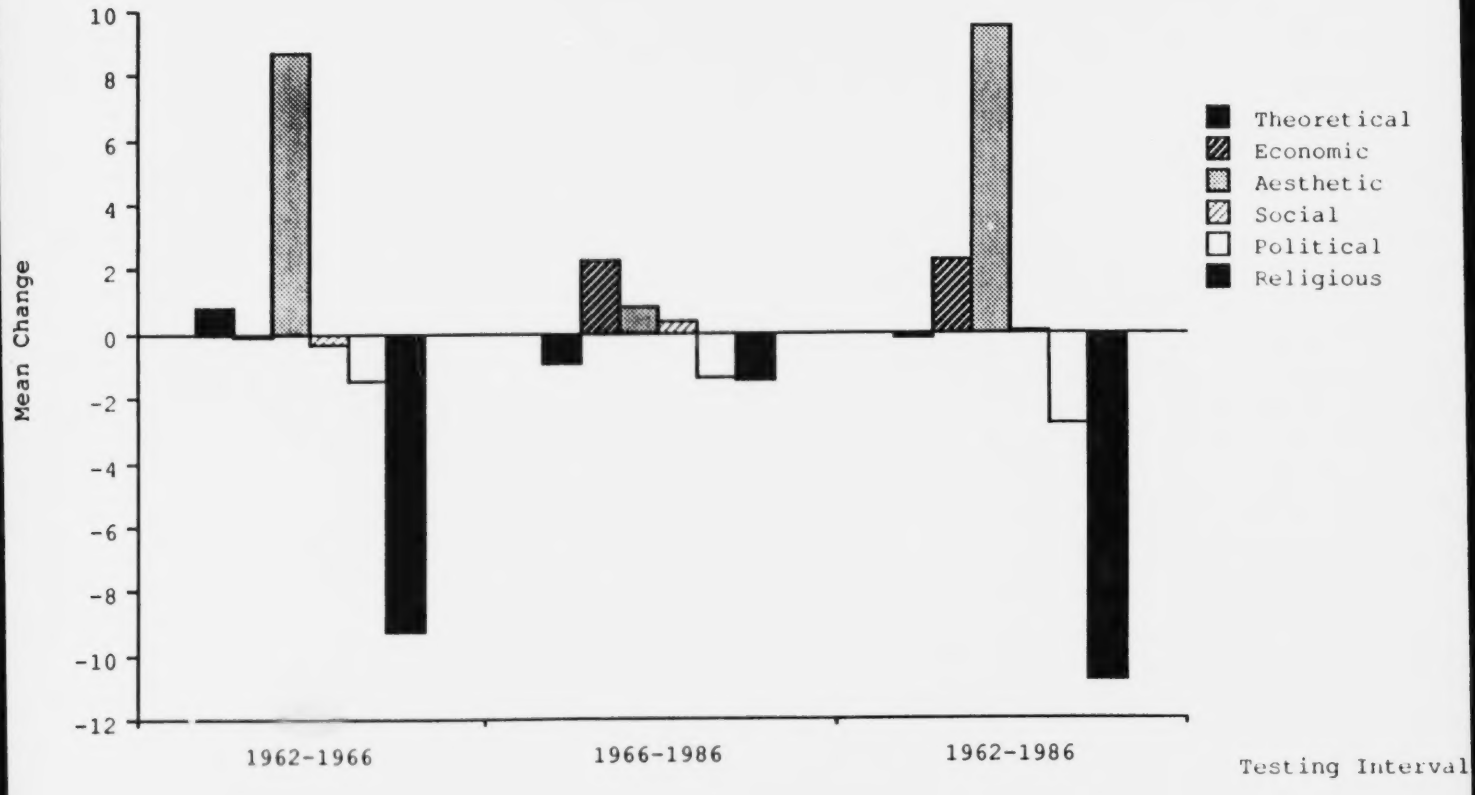

Figure 6A Berea College Mean Change for

Study of Values Scales by Testing Interval

N=53

Table 1
Berea College Median Polished Mean Scale Residuals by Year[a]

Row Effects	Scale	1962	1966	1986
- .80	Theoretical	0	0.81	- .09
-2.12	Economic	0	- .04	2.29
1.48	Aesthetic	-8.70	0	0.85
0.81	Social	0	- .32	0.09
-2.54	Political	1.46	0	-1.31
0.98	Religious	9.28	0	-1.44
	Column Effects	0	0	- .04

[a] n=53 Grand Effect = 39.94

(C. E.) describes the effect from year to year (or column to column) relative to the G. E.

When each of the components of a polished table is added together, each cell of the newly polished table will be equal to each cell of an original table of raw scale scores (Velleman and Hoaglin, p. 222). This relationship for each cell of the table is expressed by the following equations:

fit = G. E. + R. E. + C. E.
residual = raw data - fit
raw data = G. E. + R. E. + C. E. + residual

The fit describes each cell of the polished table, so that one could ask, "how well does the model fit the data?" The residuals appearing in each cell indicate what part of the response in the cell cannot be explained by the fit; they are the unique interactions of rows and columns. A negative residual means that the fit for that unique cell is higher than the actual observed response (or raw data).

Table 1 complements the findings of previously discussed output. It also shows, from the R. E., that three scales have overall negative effects (the Political, Economic, and Theoretical) in relation to the G. E. as well as negative effects in relation to the other three scales (the Aesthetic, Religious, and Social). The column effects are negligible. The residuals indicate that for the Aesthetic Scale the respondents: scored lower than expected in aesthetic values preferences as freshmen; scored as expected as seniors; and scored only slightly higher than expected as alumni. The pattern of scoring expectations for the Religious Scale reverses that of the Aesthetic Scale: freshmen scored higher; seniors scored as expected; and alumni scored lower. Again, the ipsative nature of the Study of Values helps to explain the residual patterns seen in Table 1.

Study of Values Scale Change Trends

Mean change for each scale and testing interval is shown in Table 2. It can be noted that the amount of change which occurs is never significant for theoretical or social values

Table 2
Berea College Study of Values Mean Change Scores by Testing Interval a)

Scale	M Change	T	PR>T
1962-1966			
Theoretical	0.81	0.71	0.48
Economic	- .04	0.05	0.95
Aesthetic	8.70	8.06	0.0001**
Social	- .32	- .15	0.88
Political	-1.45	-1.04	0.30
Religious	-9.28	-6.17	0.0001**
1966-1986			
Theoretical	- .94	- .33	0.74
Economic	2.28	2.35	0.02*
Aesthetic	0.81	0.82	0.41
Social	0.38	- .50	0.62
Political	-1.36	-1.29	0.20
Religious	-1.47	-1.30	0.20
1962-1986			
Theoretical	- .13	- .22	0.82
Economic	2.25	2.95	0.0004**
Aesthetic	9.51	8.25	0.0001**
Social	0.06	0.17	0.87
Political	-2.81	-2.99	0.0003**
Religious	-10.75	-8.13	0.001**

Note. * = p>.05; ** = p>.01; [a] n=53

preferences. Large changes for the Aesthetic and Religious scales tend to cancel each other out. The Economic Scale is the only value area to show change in what would otherwise be a stable alumni period. Once these respondents graduated from college, they did not undergo much change in values preferences. But when the 24 year period is examined, more notable changes can be seen to have occurred. From 1962 to 1986 one finds that there has been an intensifying of values preference change which had begun sometime during the college years. It is when the dynamic period of college is compared to the stable alumni period that greater magnitudes of differences

are noted, and the Political Scale is never significant for change until freshmen and alumni are compared.

The total amounts of change which occurred over all three periods of study are summarized in Figure 6A. The four year college period is easily seen as being more dynamic than the 20 year alumni period. But the 24 year period shows the greatest extremes of change because the direction of change in 1962 was the same as the direction in 1986 for the scales changing the most--the Religious, Aesthetic, and Political. Theoretical, Economic, and Social scales' change was different for each interval, so that their 24 year total change was of even lesser magnitude.

Study of Values change can also be studied by considering each scale distribution separately. Because the Aesthetic and Religious scales are the ones presenting the most dynamic change they will be viewed in greater detail. Figure 6B shows Aesthetic Scale change for each Study of Values testing interval involving the Class of 1966. The stem-and-leaf serves as a histogram, where the first column of numbers lists the cumulative frequency of individuals having scores in each row. Parentheses enclose the number of scores in the row containing the median, and also indicate the point where the number of individuals scoring in each successive row is subtracted from the total. The stem lists the first part of the score for the individuals in that row with its unit equalling 10.0. Each digit in the leaf rows has a unit of 1.0 and represents a single score. Therefore, the first row in Figure 6B for the college period has four individuals presenting the distribution's lowest scores -8, -6, and -5 showing how their scores on the Aesthetic Scale decrease during the college period. Eighty-seven percent of the Berea College students underwent an increase in aesthetic values preferences during college. The most aberrant change was for the individual increasing these preferences by 36 points. Most of the students increased by 11 points from freshman to senior points of measurement.

The middle section of Figure 6B reveals the spread of scores for the alumni period. Forty-seven percent of the alumni decreased in aesthetic values preferences after leaving college. Median change is at zero. The 24 year period's change is largely positive (for 87% of the respondents), and three individuals increased in aesthetic values preferences by more than 30 points.

Religious Scale change over the years is depicted in Figure 7. The college period distribution of change scores is at the top of the figure, and one can note the large number of respondents who underwent a decline in religious values preferences (79%). The magnitude of this change in the negative direction is greater than is the positive change. Mean change is -9 and median change is -7 points, so the mean can be seen to be lowered somewhat by extreme scoring. Change for the

1962-1966

frequency	stem	leaf
3	-0	865
7	-0	4310
14	0	0011344
(13)	0	5666677888899
26	1	00000111111444
12	1	555677777
3	2	02
1	2	
1	3	
1	3	6

1966-1986

1	-1	8
7	-1	421110
18	-0	99887665555
25	-0	3222210
(12)	0	001223333444
16	0	5566678
9	1	01223
4	1	58
2	2	3
1	2	9

1962-1986

1	-1	0
2	-0	5
7	-0	44431
16	0	011333444
(16)	0	5666666778888999
21	1	011244
15	1	55555699
7	2	023
4	2	6
3	3	4
2	3	57

Figure 6 B Stem-and-Leaf Displays for Berea College Study of Values Aesthetic Scale Change by Testing Interval

n=53

1962-1966

frequency	stem	leaf
2	-3	96
4	-3	42
7	-2	985
11	-2	4311
11	-1	
20	-1	444220000
(16)	-0	9888877777665555
17	-0	444331
11	0	1122244
4	0	55
2	1	0
1	1	7

1966-1986

1	-2	1
10	-1	999986655
14	-1	2200
20	-0	987665
(9)	-0	432221100
24	0	001123344
15	0	55688
10	1	00234
5	1	578
2	2	00

1962-1986

1	-4	2
2	-3	5
3	-3	1
8	-2	98776
13	-2	44200
16	-1	995
26	-1	4443221100
(12)	-0	999998887655
15	-0	43310
10	0	003
7	0	55667
2	1	3
1	1	7

Figure 7. Stem-and-Leaf Displays for Berea College Study of Values Religious Scale Change by Testing Interval

n=53

twenty-four year period shows overall decrease for seventy-nine percent of respondents. In thirty percent of the cases

this decrease is by less than ten points. One very extreme changer decreased from freshman to 20 year alumnus status by 42 points.

An additional tool which helps to describe and compare these distributions by separate testing interval is a series of box-and-whisker plots. Figures 8 through 10 portray Study of Values scale change in relation to all other scales' changes by interval. Figure 8 displays change for the college years. The four scales which have previously been described as changing the least amounts show medians at or near zero (Theoretical, Economic, Social, and Political). Most obvious change in relation to the other scales is for the Aesthetic Scale with median, midspread, and highest outlier further in the direction of positive change than any other distribution. The Religious Scale is predominant on the negative side of the points scale, and it also reveals extremes of scoring for at least four respondents. There were no extreme amounts of change occurring for the Social or Political scales, and the midspreads vary by only a few points for all scales except the Aesthetic and Religious.

The boxplots in Figure 9 demonstrate change distributions for 1966 to 1986, and they can all be seen to center around only small amounts of change across scales for the alumni period of study. Although outliers are present as extreme amounts of change for theoretical, aesthetic, and political values preferences, the other scales' distributions reveal little variation. This flattened profile has been indicated in previously discussed figures. The Economic Scale should be observed as presenting the highest median (+3 points of change) and highest mean (+2.3 points of change) for alumni.

Figure 10 summarizes the change occurring for this Berea College study over 24 years. These boxplots show greater variation than did the boxplots of scale change for the other two intervals. The medians and midspreads for theoretical and social values are centered over zero change while the economic is slightly positive and the political is slightly negative. Once again, the more dynamic changes occurring for aesthetic and religious values preferences can be seen. Outliers are depicted for the Aesthetic and Social scales, and the Religious Scale's heterogeneity is even more obvious than before.

Change Trends for Selected Variables

Several variables have been selected in order to allow a more directed look at the respondents' changes in values prferences. Gender and freshman Appalachian status were studied across the 1962 to 1986 research period. Education beyond the bachelor's level and participation in selected categories of activities were studied for the 1966 to 1986 alumni period.

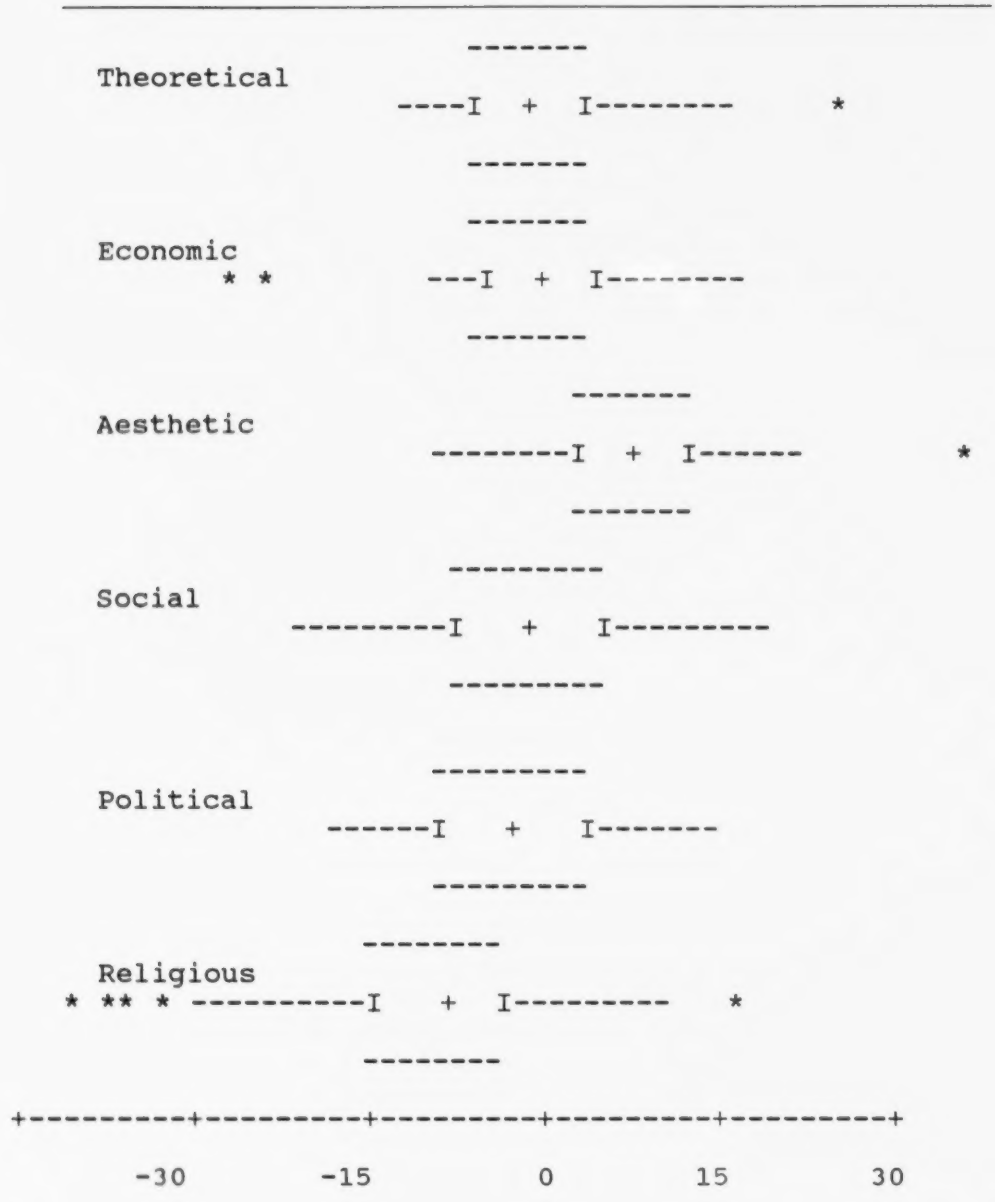

Figure 8. Boxplots of Berea College Study of Values Mean Score Change by Scale for 1962 to 1966

N=53

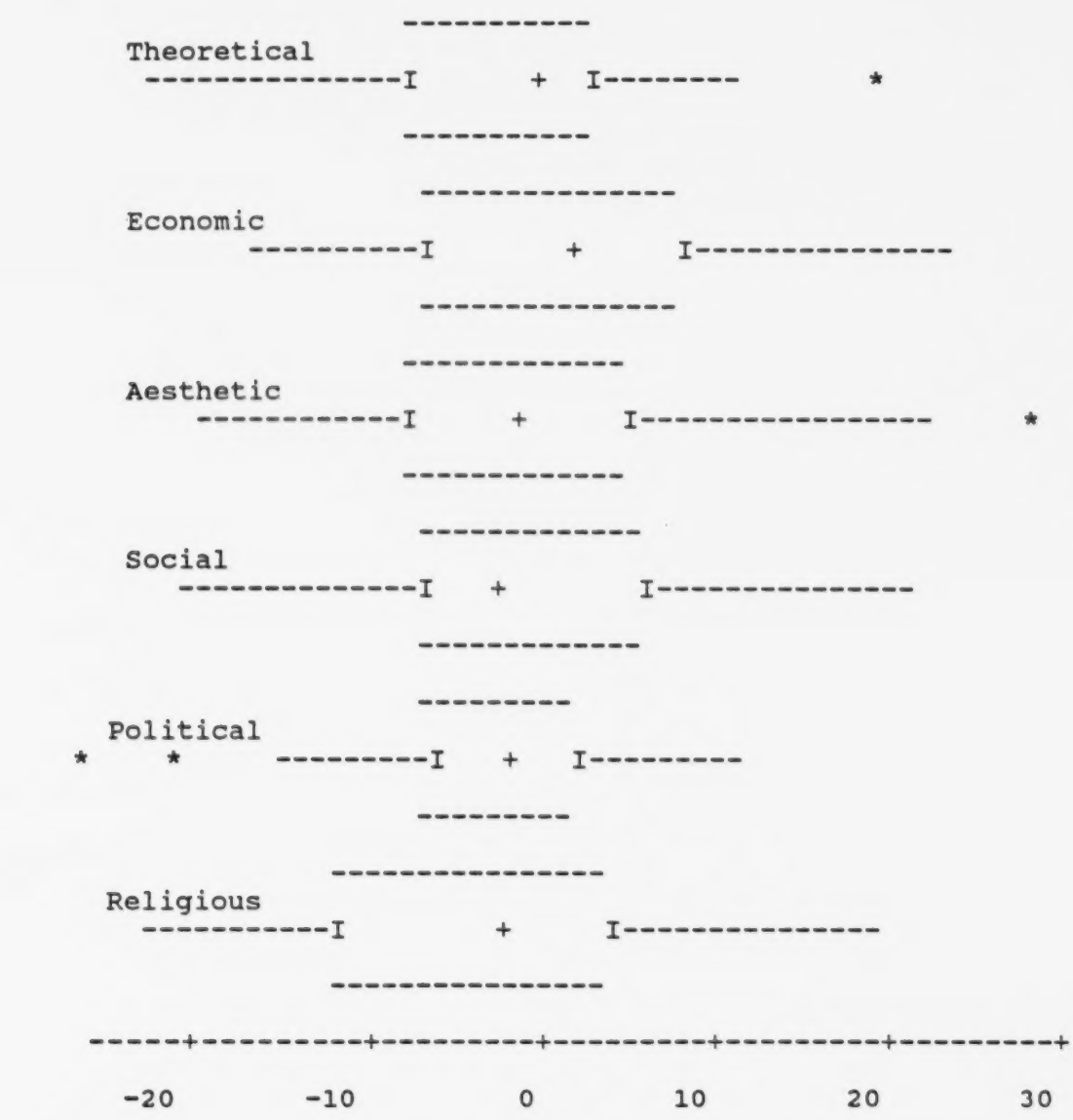

Figure 9. Berea College Alumni Boxplots of Study of Values Mean Score Change by Scale for 1966 to 1986

n=53

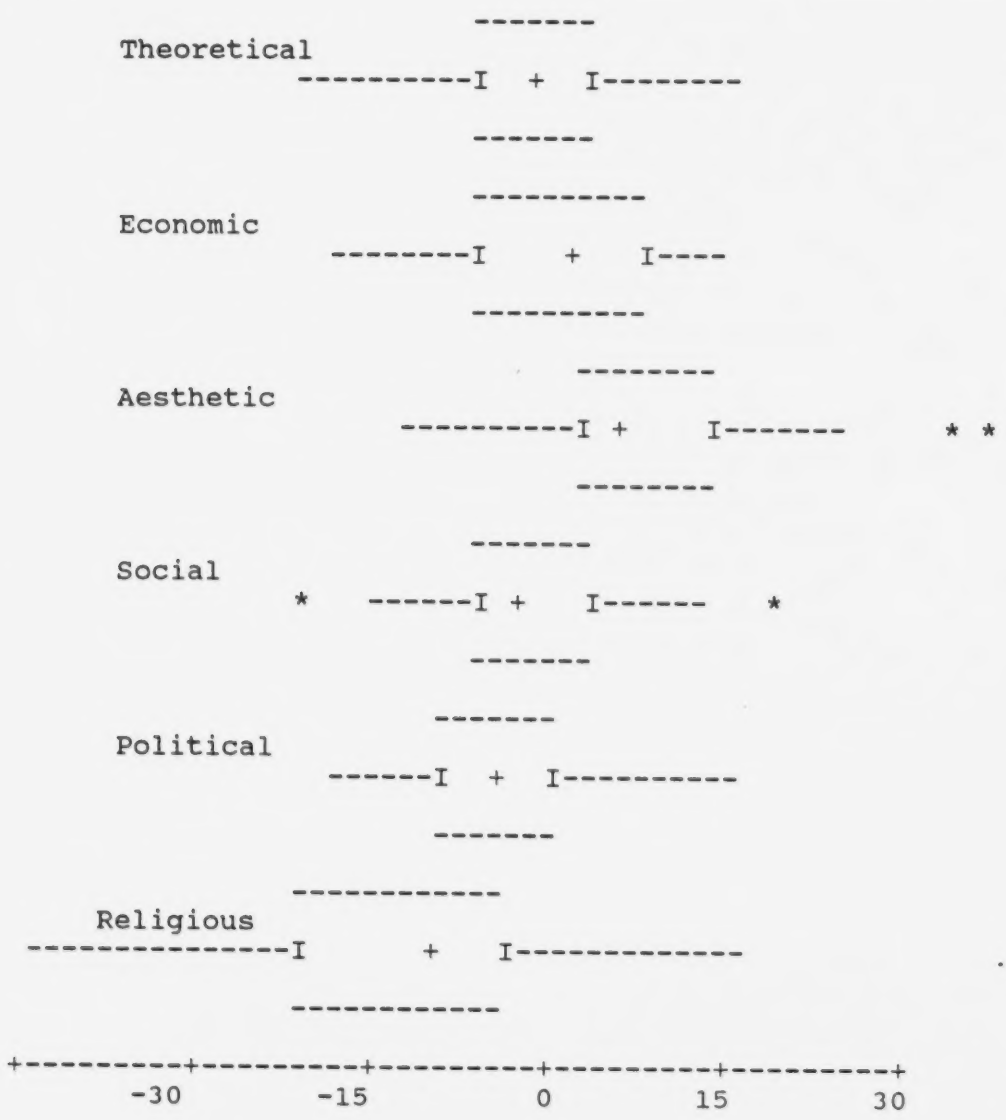

Figure 10. Boxplots of Berea College Study of Values Mean Score Change by Scale for 1962 to 1986

N=53

Gender

It can be determined from Table 3 that differences in mean Study of Values scale scores do exist when one considers gender. Particularly noticeable patterns of differences in the collegiate normative scores are evident for males and females so that a "typical" gender related profile can be created. The Study of Values test booklet and manual indicate that the normative group males score higher in the theoretical, economic, and political preference areas; while females score higher in the aesthetic, social, and religious areas. These patterns are consistent with the literature. Table 3 reveals that these gender associated scoring patterns also exist when Berea freshmen are considered. In 1966 these scoring trends continued, as they did in 1986.

A further look at gender differences is provided by Table 4. The mean gender differences column simplifies the view of gender associated scales by showing the mean number of points by which males outscored females on Theoretical, Economic, and Political scales by year of Study of values administration. The offset column of female associated scales--the Aesthetic, Social, and Religious--shows how females outscored males at each testing in these values preferences areas. When gender differences are noted by testing interval, even more interesting findings emerge: gender differences intensify during college except for the Political and Aesthetic scales; gender differences present negative values for all scales except Aesthetic for 1966 to 1986 and negative values for all scales except Social for 1962 to 1986. The negative difference values in the middle section of Table 4 show how the genders are becoming more similar with successive testings; the magnitude of the gender gap in scoring is least for the 1986 Study of Values administration. When 1962 and 1986 differences are compared, they are smaller and five of them are negative indicating that the intensification of gender associated scale scoring has turned around and the genders are less different as alumni than as college seniors.

Additional findings concerning gender change over the testing intervals are provided by Table 5. Significant change on the Aesthetic and Religious scales is found for the college and 24 year periods for both genders. Economic Scale change becomes significant for females during the alumni period and maintains significance when the 24 year period is considered. This change for females indicates an increase in economic values preferences. When college freshman and 20 year alumni statuses are compared, males exhibit a decrease in political values preferences which is significant at the .05 level.

Table 3
Mean Study of Values Scale Scores for Berea College and Normative Group by Gender and Year

	Normative Group			
	Males [a]		Females [b]	
Scale	M	SD	M	SD
Theoretical	43.8	7.3	35.8	7.2
Economic	42.3	8.0	37.9	7.3
Aesthetic	35.1	8.5	42.7	8.3
Social	37.1	7.0	42.0	7.0
Political	42.9	6.6	37.8	6.2
Religious	38.2	9.3	43.8	9.4
	Berea College [c d]			
	1962			
Theoretical	42.0	6.4	36.9	6.4
Economic	40.8	7.3	35.5	5.4
Aesthetic	29.5	9.0	35.2	4.6
Social	39.3	5.7	41.8	5.7
Political	40.3	5.9	37.7	7.4
Religious	48.0	6.5	51.9	8.2
	1966			
Theoretical	44.5	8.9	36.5	7.5
Economic	41.1	9.6	35.2	6.5
Aesthetic	40.0	11.3	42.6	7.7
Social	38.4	9.9	41.9	8.4
Political	38.7	5.4	36.4	7.5
Religious	37.4	12.0	43.6	10.3
	1986			
Theoretical	41.6	6.3	37.0	5.5
Economic	42.5	10.1	38.2	6.5
Aesthetic	39.5	12.8	44.3	7.9
Social	39.1	5.8	42.1	5.0
Political	36.8	4.5	35.5	5.2
Religious	38.8	12.3	40.0	9.1

[a] n=2489; [b] n=1289; [c] Male n=23; [d] Female n=30

Table 4
Mean Study of Values Scale Differences by Gender

Scale	Mean Gender Difference		
Normative Group [a b]			
Theoretical *	8.0		
Economic	4.9		
Political	5.1		
Aesthetic **	7.6		
Social	4.9		
Religious	5.8		
Berea College 1962 [c d]			
Theoretical *	5.1		
Economic	5.3		
Political	2.6		
Aesthetic **	5.7		
Social	2.5		
Religious	3.9		
Berea College 1966		Difference from 1962	
Theoretical *	8.0	2.9	
Economic	5.9	0.6	
Political	2.3	- .3	
Aesthetic **	2.6	-3.1	
Social	3.5	1.0	
Religious	6.2	2.3	
Berea College 1986		Difference from 1966	Diff.from 1962
Theoretical *	4.6	-3.4	- .5
Economic	4.3	-1.6	-1.0
Political	1.3	-1.0	-1.3
Aesthetic **	4.8	2.2	- .9
Social	3.0	- .5	0.5
Religious	1.2	-5.0	-2.7

Note. * difference of male - female score; **difference of female - male score.

[a]Male n=2489; [b]Female n=1289; [c]Male n=23; [d]Female n=30

Table 5
Berea College Study of Values Mean Change by Gender and Testing Interval

	1962-1966					
	Males (a)			Females (b)		
Scale	M-Change	T	PR>T	M-Change	T	PR>T
Theoretical	2.43	1.28	0.21	- .43	- .36	0.72
Economic	0.30	0.15	0.88	- .30	- .31	0.76
Aesthetic	10.43	5.98	0.0001**	7.37	5.47	0.0001**
Social	- .87	- .42	0.68	0.10	0.07	0.95
Political	-1.57	- .95	0.35	-1.37	-1.00	0.33
Religious	-10.52	-4.25	0.0003**	-8.33	-3.84	0.0006**
	1966-1986					
Theoretical	-2.87	-1.78	0.09	0.53	0.40	0.69
Economic	1.35	0.69	0.49	3.00	2.05	0.05*
Aesthetic	- .43	- .21	0.83	1.76	1.05	0.30
Social	0.70	0.32	0.75	0.13	0.09	0.93
Political	-1.96	-1.90	0.07	- .90	- .57	0.57
Religious	1.35	0.54	0.59	-3.63	-1.94	0.06
	1962-1986					
Theoretical	- .43	- .22	0.83	0.10	0.08	0.93
Economic	1.65	1.00	0.33	2.70	2.05	0.05*
Aesthetic	10.00	4.33	0.0003**	9.13	5.48	0.0001**
Social	- .17	- .09	0.93	0.23	0.20	0.85
Political	-3.52	-2.59	0.02*	-2.26	-1.50	0.14
Religious	-9.17	-4.55	0.0001**	-11.97	-4.68	0.0001**

Note. *p<.05; **p<.01; [a] n=23; [b] n=30

Appalachian Status

Table 6
Mean Study of Values Scale Scores for Berea College by Appalachian Status and Year

	Appalachian a)		Non-Appalachian b)	
	1962			
Scale	M	SD	M	SD
Theoretical	39.8	7.0	37.3	8.6
Economic	37.5	6.8	35.8	6.3
Aesthetic	32.7	8.1	34.3	4.5
Social	40.5	6.0	42.2	5.5
Political	39.1	6.1	36.5	10.7
Religious	50.2	7.2	50.5	10.2
	1966			
Theoretical	39.7	9.0	38.3	8.1
Economic	37.3	8.2	36.2	8.2
Aesthetic	43.1	10.0	37.5	9.4
Social	40.5	9.3	39.0	7.9
Political	38.0	6.7	32.7	6.6
Religious	41.4	11.6	36.5	10.7
	1986			
Theoretical	38.1	6.4	40.7	3.9
Economic	39.0	8.9	39.3	5.9
Aesthetic	42.5	10.6	43.2	4.1
Social	40.4	5.8	44.3	2.9
Political	36.4	4.7	35.8	5.9
Religious	40.3	10.8	36.7	5.2

a) n=38; b) n=6

A second variable studied across the research period was freshman status as being from Appalachia or not. Table 6 provides mean Study of Values scale scores for each test administration. Smaller numbers of non-Appalachians are reflective of Berea's admissions policy. Of note for the college period is the smaller increase in aesthetic values and the greater decrease in religious values for non-Appalachians than for Appalachians even though the directions of the changes were in agreement. Alumni change reveals that non-Appalachians increased in aesthetic values after graduation while Appalachians decreased; non-Appalachians increased their religious values preferences slightly after graduation while Appalachians decreased on this scale by 1.1 points. Over the 24 year period, Appalachians increased in aesthetic values by

more (by .9 points) and decreased less (by 3.9 points) in religious values than did non-Appalachians.

Education

The Berea alumni were questioned in this study about their formal educational experiences beyond the bachelor's degree. There were 46 alumni who had earned masters degrees and nine who held doctorates when questioned in 1986. The degrees encompassed 29 different majors. Table 7 presents 1986 mean scale scores and mean change scores for the alumni period while controlling for education. Scale scores are higher for the advanced educated group for all scales except the Economic and the Theoretical. The Theoretical mean score is .8 points lower for those with advanced education.

Table 7
Berea College Alumni 1986 Study of Values Means and Mean Change Scores for 1966 to 1986 by Education

Scale	1986 M	SD	M Change	T	PR>T
Advanced Education [a]					
Theoretical	38.8	6.5	-1.75	-1.2	0.23
Economic	38.6	7.8	2.09	1.4	0.18
Aesthetic	43.7	12.0	0.82	0.5	0.64
Social	40.9	5.8	1.15	0.7	0.47
Political	36.6	5.1	- .27	- .24	0.81
Religious	40.6	10.9	0.76	0.4	0.69
Bachelor's Education [b]					
Theoretical	39.6	6.0	0.21	0.14	0.89
Economic	42.4	9.3	2.21	1.11	0.28
Aesthetic	40.2	6.8	1.11	0.53	0.6
Social	40.7	5.1	- .47	- .23	0.81
Political	34.5	3.9	-3.42	-1.77	0.09
Religious	37.1	9.8	-5.32	-2.11	0.05*

Note. * p>.05; [a] n=33; [b] n=19

Mean change for the alumni period is of relatively small magnitude when respondents are separated by their amount of formal higher education. The only statistically significant difference in amount of change is on the Religious Scale with those having a bachelor's degree showing a larger decrease in religious values preferences from 1966 to 1986. It was found that the 1966 Religious Scale mean for those at the bachelor's level was 42.4 while for those with advanced levels of education the 1966 Religious Scale mean score was 39.9. Those obtaining advanced degrees show more stability (M Change is 0.76) in religious values preferences following graduation from Berea College than those who end their formal education with a bachelor's degree (M Change is -5.32). The Political Scale reveals similar stability for those with advanced education and a decrease following college for those with a bachelor's only. The respondents who go further in higher education increase less (0.82) in aesthetic values preferences after college graduation than bachelor's level respondents (1.11), but those who eventually earn higher degrees value aesthetic items from the Study of Values more as college seniors than those who do not continue their formal education. This finding may be reflective of the college majors chosen as well as of the values of individuals who were able to continue their higher education after Berea.

Pace Alumni Survey Questionnaire

A series of activity frequencies was analyzed in order to obtain a better view of the participation of the Class of 1966 in selected areas of involvement as an index of their alumni behavior relative to established criteria for measuring values. Table 8 indicates that alumni are most involved in Religion, Education, and Community Affairs. The individuals can still be seen to be diverse in their amounts of participation in that each inventory has respondents who do not participate as well as those who have maximum involvement. When Pace inventories are correlated with 1986 Study of Values scales the highest correlation is for the Aesthetic Scale with: Literature (r=.53), Art (r=.50), and Intercultural (r=.45). The Religious Scale correlates with Pace Religion (r=.52). No other notable patterns of relationships were found between these two instruments.

SUMMARY AND CONCLUSIONS

Change was seen to be most dynamic for the Berea College Class of 1966 during the college period, from 1962 to 1966. The two most active value scales were the Aesthetic and Religious with freshmen scoring lowest of the six Study of Values scales on aesthetic items and highest on religious. The ipsative nature of the test instrument requires that such a trade-off of scoring extremes be made. Following the freshman year, there was a levelling out of the scale means.

Table 8
1986 Berea College Class Responses to the Pace Activity Scales a)

Inventory	M	SD	% of item participation	number possible	range
Community Affairs	7.0	2.7	58%	12	0-12
National & State Politics	7.4	2.5	50%	14	0-14
Science	3.8	2.3	38%	10	0-10
International	2.7	1.6	30%	9	0- 8
Art	2.7	2.3	30%	9	0- 9
Literature	3.9	2.3	43%	9	0- 9
Education	6.3	2.1	63%	10	0-10
Music	4.6	2.5	42%	11	0-10
Drama	3.5	2.2	32%	11	0-11
Religion	5.8	2.8	64%	9	0- 9
Intercultural	2.8	2.6	28%	10	0-10

[a] n=88

The literature has indicated that beyond the more pronounced amounts of change for aesthetic and religious values preferences, change for the other four scales is not very notable or predictable. In trying to account for the amounts of change seen in the Berea College Class of 1966 one must take note of inherent problems which make interpretation even more difficult. Feldman and Newcomb (1969, p. 8) have commented on the findings of the majority of research studies which consider the Study of Values. Religious values are nearly always the highest for freshmen, and their decrease may be due in some manner to regression and ceiling effects while aesthetic values are nearly always the lowest for freshmen, and their increase may be due to regression and floor effects. Freshman scores which are very high or very low may actually contain large errors of measurement; senior scorers (or alumni scorers) who produce extreme scores are less likely to have had such extreme scores in their earlier responses to the instrument. Either of

these changes may actually be artifactual--when extreme scores become less extreme at a later testing or when less extreme scores become extreme at a later testing--they have undergone regression effcts due to measurement errors.

Another problem concerns ceiling and floor effects which relate to individuals who score at extremes of the top or bottom of the distribution where there is "...little or no room to make scores that are still more extreme in the same direction....As a result, merely because of the limits of the instrument such persons have little opportunity to do anything except to show no change" (Feldman and Newcomb, pp. 62-63).

Although problems of interpretation do exist there are several observations which should be made. The Berea students entered college as rural, mountain young people. They came frequently from Fundamentalist backgrounds (Bobbitt, 1969), and they perceived that their religious values sources were the strongest. Berea College had and has a religious mission (Fairchild, 1875), and one often finds that religious individuals will gravitate to an environment which will be facilitative to religious values. It is not difficult to understand why Berea freshmen scored so high and greatly surpassed the collegiate normative group on the Religious Scale of the Study of Values. It is also relatively clear why scoring on the Aesthetic Scale was so low. Even though these Berea students came from rural and often very isolated communities where experiences in the arts were more limited than those presented in more cosmopolitan and easily-accessible communities, their aesthetic values preferences are in tune with the preferences of other college freshmen. Aesthetic values are often low for students at this point in their lives.

If we would combine these scoring trends with the knowledge we have about ipsative instruments and also consider measurement error and ceiling/floor effects when we look at the change occurring in these two scales during college, we could say that our view of the freshman to senior change should be tempered somewhat. The directions of the changes presented are undoubtedly accurate, but the magnitude of the changes is probably exaggerated.

Berea College alumni change was measured from 1966 to 1986. Change is primarily in economic and aesthetic values preferences increase and political values preference decrease. But the magnitude of these changes is small. The Pace Activity Scales provide evidence of at least moderate alumni participation in such areas as Community Affairs and National and State Politics. The Manual of the Study of Values equates political values with interest in power. Berea alumni have provided evidence that their political values preference as measured in this research has never been very high, and with each test administration it has decreased. There has obviously been a trade-off with increases in other scales such as the Economic and Aesthetic.

Alumni scoring on the Aesthetic and Religious scales of the Study of Values emphasizes the heterogeneity of respondents which persists 20 years after college graduation. Although change boxplots for all scales have displayed medians at or near zero, there are respondents who increase or decrease by more than 20 points on several of the scales. The change trends mask the movements of individuals.

Gender was found to be an interesting factor in the study of values preferences and their change. Males consistently score higher in Theoretical, Economic, and Political values preferences and females score higher in Aesthetic, Social, and Religious preference areas. Gender differences intensify some time during college for all scales except Political and Aesthetic. For these two scales the differences between male and female scoring are reduced, just as the gender differences are reduced for the alumni period for all but the aesthetic values area. The genders become more similar as they become older. Increase in Economic Scale values preferences is largely due to the female respondents' increase in economic valuing, and the decrease in Political Scale values is largely due to male decreases in scoring in this area. Change is never significant for the Theoretical or Social scales, but the Aesthetic is the most dynamic for males and the Religious is the most changeable for females when freshmen and alumni are compared.

The focus on values change and freshman status as being an Appalachian or not allowed the finding that Appalachians increase more in aesthetic values and decrease less in religious values than do non-Appalachians during college and over 24 years. Part of the explanation for this may entail looking at the lower initial Aesthetic Scale scores for Appalachians which may be exemplifying the floor effect. However, the larger decrease in Religious Scale scores for non-Appalachians during college, with little recoup in the alumni period, is not an easily understood finding.

Education beyond the bachelor's degree was also considered as an alumni variable. Change from 1966 to 1986 is relatively small for both educational categories with the only significant change being on the Religious Scale for those who hold only the bachelor's. One could say that those holding advanced degrees are more stable during the alumni period in their religious valuing than are those at the bachelor's level. While both groups decrease in political values, the bachelor's group decreased more as alumni. Aesthetic preferences for the advanced group are higher in 1966 and in 1986. Individual curriculae they participated in could be a factor in this scoring and so could the congruence between the academic life and the valuing of form and harmony (Allport et al., 1970, p. 4) and an academic culture more conducive to the arts.

Participation in alumni activities related to the content areas of a liberal arts education shows great diversity among the Berea alumni in 1986, but their largest percentage of

participation is in religious and educational endeavors. They also appear as a group to be at least moderately active in community affairs. These activities could well be reflections of priorities held by most middle class, college-educated adults who are approaching middle age. One could wish that a non-college attending control group were available for comparison.

The respondents themselves can perhaps best summarize their development from the time of their freshman entrance to their point of reflection 20 years after graduation. They wrote about their recollections of Berea, and their message is almost without exception one which points to the benefits of a liberal arts education, an education which opens one's life to broader possibilities than had existed before. One alumnus commented, "Berea opened the door for learning, a different way of life, to be some of the things I dreamed of being as a youngster." Another said, "There was a general feeling that students were from the same background--poor, motivated to learn, and a strong sense of family. A sense of 'pulling oneself up by the bootstraps' prevailed." A female teacher stated, "Berea supported my values which I lived by then and now." Since religious values were so changeable, this comment can be even more significant, "Opportunities for religious affiliation were readily available but not forced on us. Union Church provided me an opportunity to expand my horizons beyond the small Baptist Church [at home]....I gradually grew away from active involvement in any church, but the chapel services provided a weekly opportunity to make a small connection with God." Finally, "Berea College reinforced the values that I learned at home and at church, but it did this by teaching me to question and to test them."

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